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THE
KNAPP SYSTEM
OF
TEETH REGULATION

WITH
ARCH BAR EXEMPLIFICATIONS

BY
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THE S. S. WHITE DENTAL MFG. CO.

SOLE AGENT

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1907

Dr. Bernhard W. Weinberger
119 West 57th St., New York

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ARCH BAR APPLIANCES.

The arch bar No. 35 is one of the most used parts of these appliances. It is a bar $5\frac{1}{2}$ inches long and threaded its entire length. The threads on this arch bar are not cut in a die plate as in common practice, but are cut with special machinery to make the bar smooth after being threaded, so that it will not irritate the soft tissues of the mouth any more than a smooth bar would. This is an important consideration not found in any other arch bar. The bar and threads are of the same diameter and pitch as all the right hand threaded parts of the appliances and all the different forms of nuts will operate on it except No. 24, No. 38 and No. 54, which are used on the studs of the studded bands only. The arch bar is of sufficient length to encircle the largest arch and will generally make two bars of ordinary length when used on the lingual side of the arch.

Greatly enlarged illustrations of the parts most commonly used in making up the arch bar appliances are shown on page 2. Fig. 1 is the arch bar and Fig 2 the double socket clutch tube bands used in anchoring the arch bar to the molars. These bands are made in four lengths so as to fit any size molar and the size wanted to fit a tooth can be easily determined by measuring the tooth with a fire wire and comparing length of the wire with the lengths of the measures Nos. 49, 50, 51 and 52, also shown in Fig. 2.

When the length of the tooth measure is between two lengths of band measures, always select the shorter length, that

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is, if the tooth measure should be between 50 and 51, select the No. 50 band.

In Fig. 10 will be found measures for the four styles of bands shown in Figs. 6 to 9, and the style of band wanted can be told by referring to the illustration accompanying the band measures. In ordering it is only necessary to give the number of the band, as this will indicate the length and style desired. For instance, a No. 3 band is the same length as No. 73, but a No. 3 band is a studded button band, and a No. 73 is a button band without a stud.

Fig. 1.

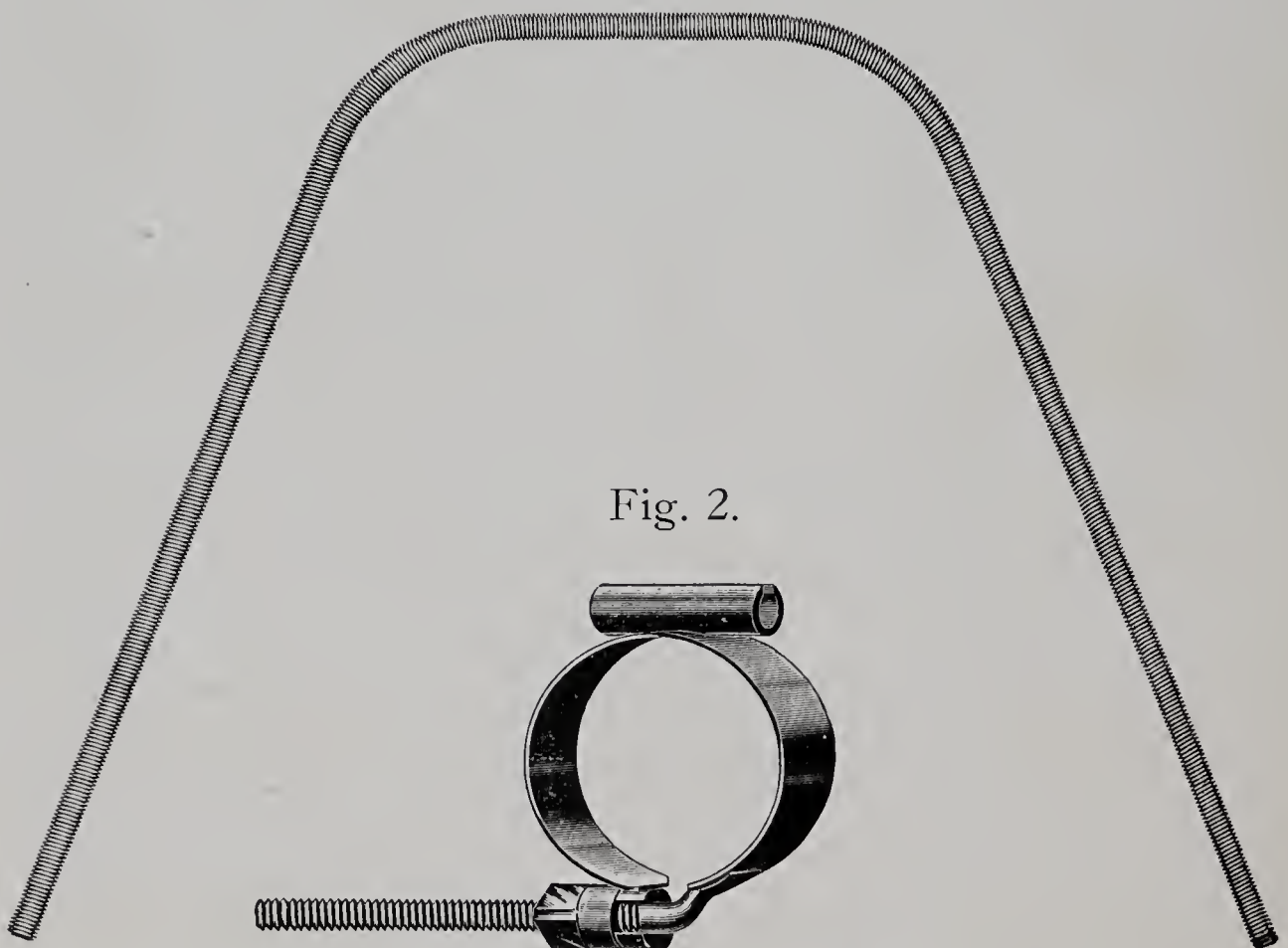
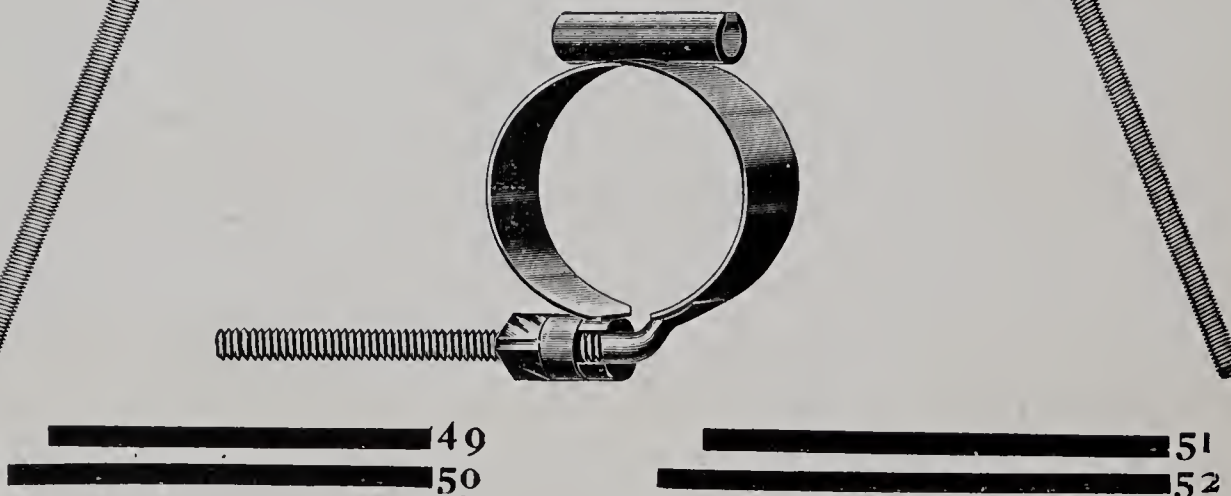


Fig. 2.



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for the progressive operator. See page 26,

Fig. 3.
Lock Nut, No. 23



Fig. 4.
Clutch Nut, No. 22

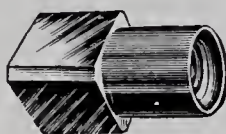


Fig. 5.
Bar End Cap, No. 34

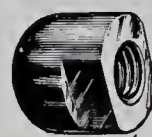


Fig. 6.
Studded Button
Band



Fig. 7.
Single Socket Button
Band

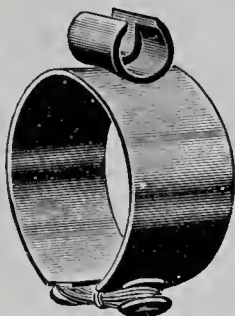


Fig. 8.
Button Band
Without Stud

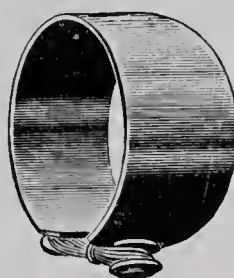


Fig. 9.
Ligature Band

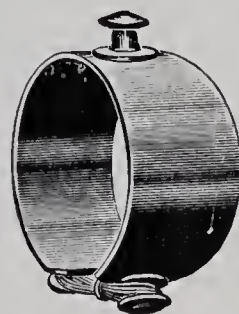


Fig. 10.

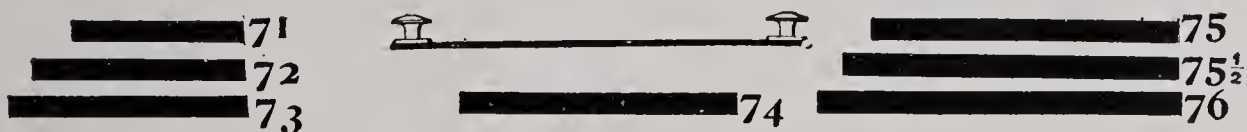
Band Measures for Studded Button Bands.



Band Measures for Single Socket Button Bands



Band Measures for Button Bands Without Studs



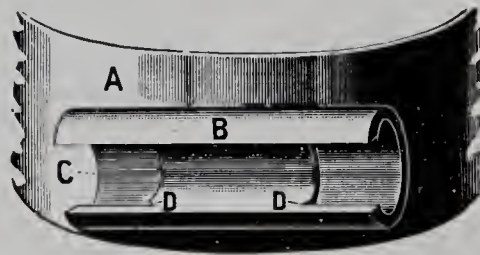
Band Measures for Ligature Bands



All busy operators can handle their own regulating cases and realize more per hour than in gold fillings, if they use regulating appliances that are **READY TO APPLY WITHOUT THE SOLDERING NUISANCE.** See page 25.

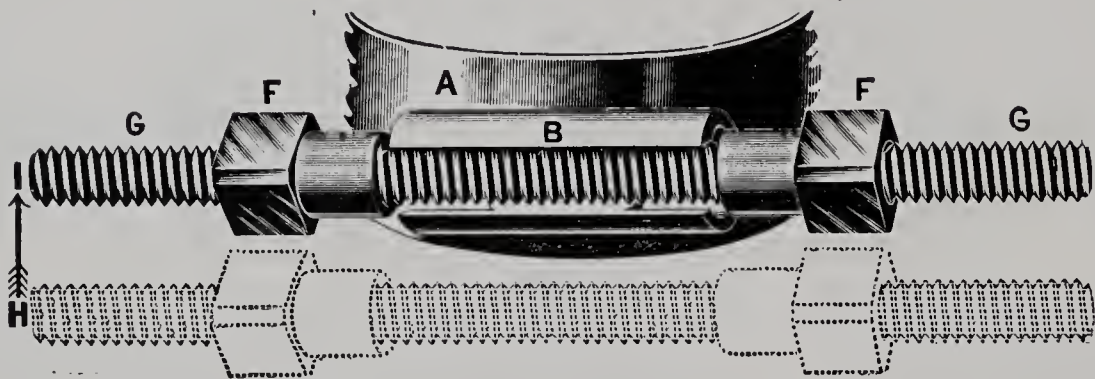
Fig. 11 is an enlarged drawing of the double socket clutch tube of the molar bands. A is the band to which the partial tube B is attached. Each end of the tube is recessed, shown at C to receive the cylindrical ends of the clutch nuts No. 22. The

Fig. 11.



operation of placing a threaded bar in position in a clutch tube by passing it through the side of the tube is illustrated in Fig. 12. A represents the band, B the clutch tube, GG indicate the

Fig. 12.

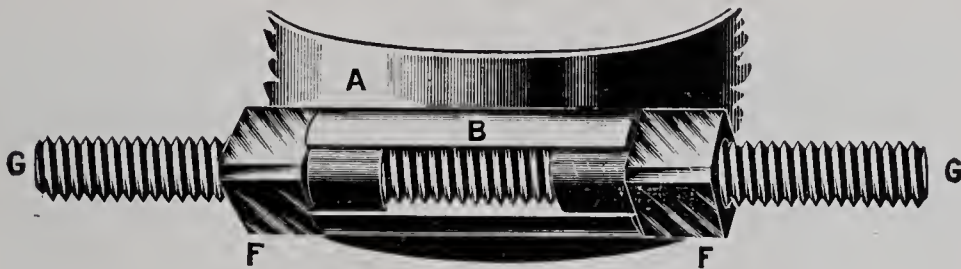


threaded bar, and FF the clutch nuts No. 22. The clutch nuts should be placed on the bar with their cylindrical portions approaching each other, and they should be a little farther apart than the length of the clutch tube. Then the bar with nuts in position, as shown at H, may be passed through the opening of the clutch tube B. The bar is held in position in the clutch tube as soon as the cylindrical end of one or both nuts has been turned into the recessed end of the tube just a

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short distance. By turning the nuts FF tightly into the tube, as shown in Fig. 13, the bar is clamped firmly into the tube. It cannot move forward, backward, or laterally, and the nuts are also locked against the tube so they cannot become loosened.

Fig. 13.



It will thus be seen that the clutch tube receives and holds firmly the arch bar in connection with the anchor tooth through the medium of the screwclamped molar band. The arch bar is also allowed to be easily and quickly placed in position or removed without taking the bands from the teeth or the clutch nuts from the bar.

This last advantage will be duly appreciated by every dentist who has attempted to place a nut on a bar or wire after passing it through a tube or pipe fixed on a tooth band in the mouth. He will well remember his efforts to put nuts on traction bars or wire arches protruding from the distal ends of the tubes on molar bands.

One of the advantages of these screw bands over all other forms of screw bands is the special form of nut and collar used in connection with the threaded screw. The collar is slotted in the same manner as the clutch tube. This permits the threaded bar to pass laterally through the side of the collar. The screw band nut is recessed to receive the projection on the collar, so that when the projection on the collar enters the recessed portion of the nut, the nut, collar, and threaded screw

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are held firmly in their relative positions. By removing the collar from the nut the threaded bar may be passed laterally through the collar and the band straightened out. Figs. 14, 15, 16, illustrate these points.

Fig. 14.

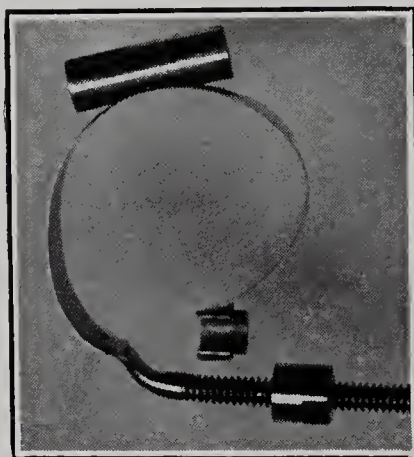


Fig. 15.



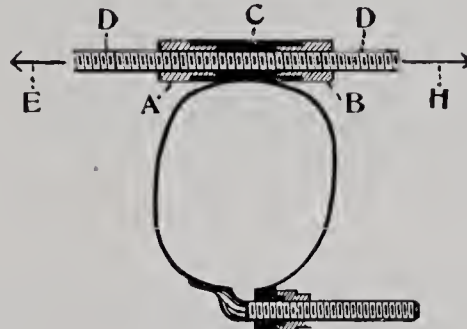
In Fig. 14 the band is shown with the nut, collar and screw in position ready for the band to be clamped to a tooth. In Fig. 15 the collar is slipped backward on the bar so that the projection is out of the recessed opening of the nut. Fig. 16 shows the band with the collar free from the screw.

Fig. 16.



Two nuts must always be used in operating a threaded bar in a clutch tube. This allows the bar to be operated equally well in either direction and to be firmly locked in the tube during the intervals between tightening. This is a most important consideration in the successful movement of teeth.

Fig. 17



In Fig. 17, C represents the clutch tube of a molar band, A and B the clutch nuts No. 22, and DD a portion of a threaded bar. When the nut A is loosened and the nut B tightened the threaded bar DD will be moved in the direction indicated by the arrow at H. When the nut B is loosened and the nut A tightened the threaded bar will travel in the direction indicated by the arrow at E. By tightening both the nuts A and B firmly against the clutch tube the bar DD is locked in the tube and cannot move in either direction.

The distance a tooth is moved each time the appliance is tightened can be easily regulated by the number of revolutions, or fractions of a revolution, the nuts are turned. One full revolution of the nut moves the appliance one one-hundredth of an inch.

When any of the bars are to be cut shorter, after the proper length has been ascertained, they should be cut with wire cutters and the bur removed with a file. After the bar has been cut it will be flattened and widened as shown at A, Fig. 18. This

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would prevent a nut being placed on or taken off this end of the bar. The file D must be held at right angles to the bar E, and the end filed to the point B. The end of the bar should then be revolved against the file, holding it at an angle of 45 degrees, to finish the margin as shown at the opposite end of the bar E.

Fig. 18.

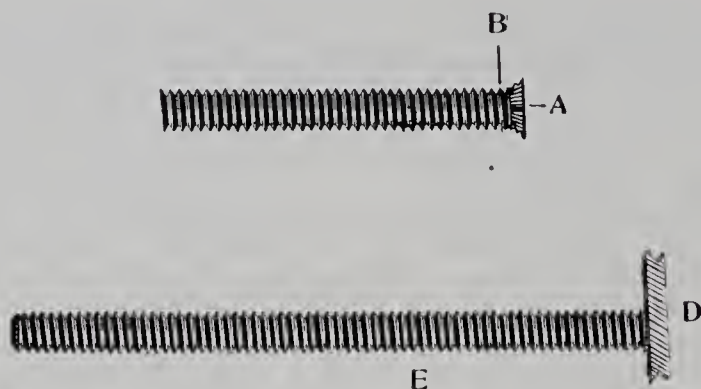
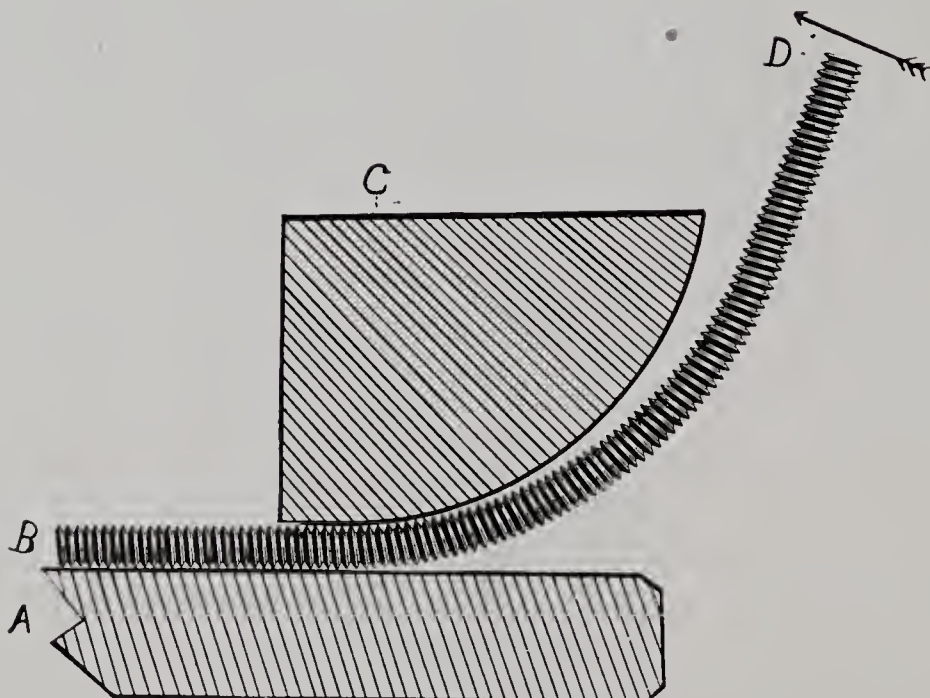


Fig. 19.



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When the threaded bars are to be bent, they should never be bent around a square corner, nor should they be held with steel pliers, as the thread will be injured. They may be bent with the fingers or as shown in Fig. 19. The bar B should be laid on a flat surface, preferably wood, another piece of wood C, should be cut to the desired shape, pressed firmly down on the bar and the end D of the bar raised until in contact with the rounded surface of the block C. Short curves may be made by bending the bar around a lead pencil.

A typical arch bar appliance is shown in Fig. 20. In this case the lateral incisor teeth are to be moved forward into line. It will be noticed that the arch bar is placed on the lingual side of the arch, as this is far better than placing it on the outside as is done in so many cases, for the reason that it affords much less inconvenience to the patient who is wearing it, besides being inconspicuous. It is also easier to operate and is far less complicated.

When two or more incisor teeth are to be moved forward, if the arch bar is placed on the lingual side of the arch it will only be necessary to band two teeth to keep the bar in position, therefore all that would show would be the bands on the two teeth. The arch bar appliance proper being entirely concealed by the teeth themselves, while if the arch bar is placed on the labial side of the arch it is necessary to band each tooth that is to be moved and then make connections from the arch bar to each tooth that has been banded. This makes a very uncleanly and unsightly arrangement besides being unnecessarily complicated, and such practice is decidedly wrong, for in ninety-five per cent of the cases the arch bar can be placed on the lingual side of the arch. There are a few cases where it is necessary to place it on the labial side, but these cases are not those where the incisors are to be moved forward.

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To return to the appliance shown in Fig. 20, it will be noticed that the laterals are banded with button bands the same as shown in Fig. 8. If so desired these teeth can, of course, be banded with studded button bands as shown in Fig. 6, the stud projecting labially, then the studs will afford attachments for retainers after the movement of the laterals had been completed, making it unnecessary to remove the bands to place retaining appliances in position.

The bands in either case should be placed so that the arch bar will pass around on the lingual side of the arch between the buttons of the bands and the gum. These buttons will then hold the arch bar in position so that it will not slip toward the incisal edges of the teeth when pressure is exerted.

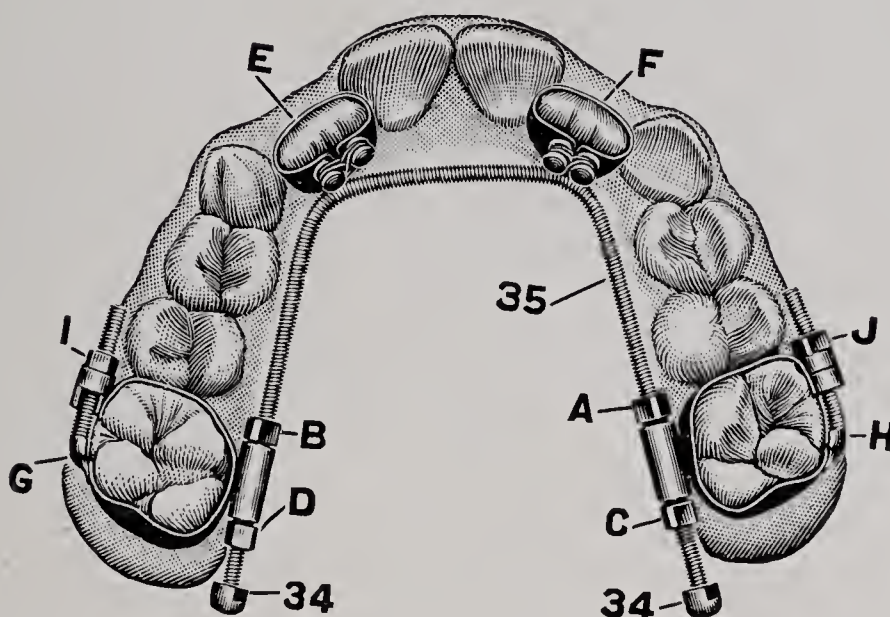
The arch bar No. 35 is then bent to conform to the shape of the arch and passes through the clutch tubes of the molar bands H and G. These molar bands are clamped to the molar teeth by the nuts I and J. The arch bar should be bent so as to rest easily in the clutch tubes, that is, have no lateral spring action if no lateral expansion of the arch is required. It will therefore be seen that in cases where it is desirable to increase the arch laterally as well as anteriorly, this can be accomplished by bending the arch bar so it is wider than the arch and must be sprung into position. When this is done the arch will be expanded at the same time the incisors are being moved forward.

It will be noticed there are bar end caps No. 34 on the distally projecting ends of the arch bar No. 35. These bar end caps are to protect the soft tissues of the mouth from any irritation that might be caused by the projecting ends of the arch bar. This, of course, is not always necessary, but in cases where the anterior teeth must be moved forward a considerable distance, the arch bar must, of course, project distally a

corresponding amount and by using the bar end caps these projecting ends can be much longer without irritating the soft palate than would be the case if no end caps were used.

After an appliance of this form has been placed in the mouth it is always necessary that the arch bar should move forward through the clutch tubes of the molar bands to accomplish the anterior movement of the laterals and to tighten

Fig. 20.



the appliance the nuts C and D should be loosened, that is, turned backward on the arch bar a revolution or fraction thereof, according to the amount of forward movement desired each time the appliance is tightened, therefore, after these nuts, C and D, have been turned one full revolution (four quarter turns), this will permit the arch bar to move forward one one-hundredth of an inch and the movement is accomplished by turning the nuts A and B, one revolution in the same direction that C and D were turned. This moves the

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arch bar forward and draws the nuts C and D into the clutch tubes.

A and B should, of course, be turned tightly into the tubes so as to again lock the appliance. By repeating this every two or three days the arch bar is moved forward a certain amount each time and holds the amount of movement absolutely until the operator again tightens the appliance.

If it is desired to move the teeth forward one two-hundredth of an inch the nuts C and D should be turned backward one-half revolution (two quarter turns), and the nuts A and B in the same direction a corresponding amount. It will thus be seen that if the nuts are turned one-quarter of a revolution the appliance is moved one four-hundredth of an inch and two revolutions move it one-fiftieth of an inch. These points must be remembered and the appliance operated accordingly if the teeth are to be moved successfully and painlessly. The amount of movement permissible is determined by the age of the patient, the direction of the tooth movement, and the stage of the operation.

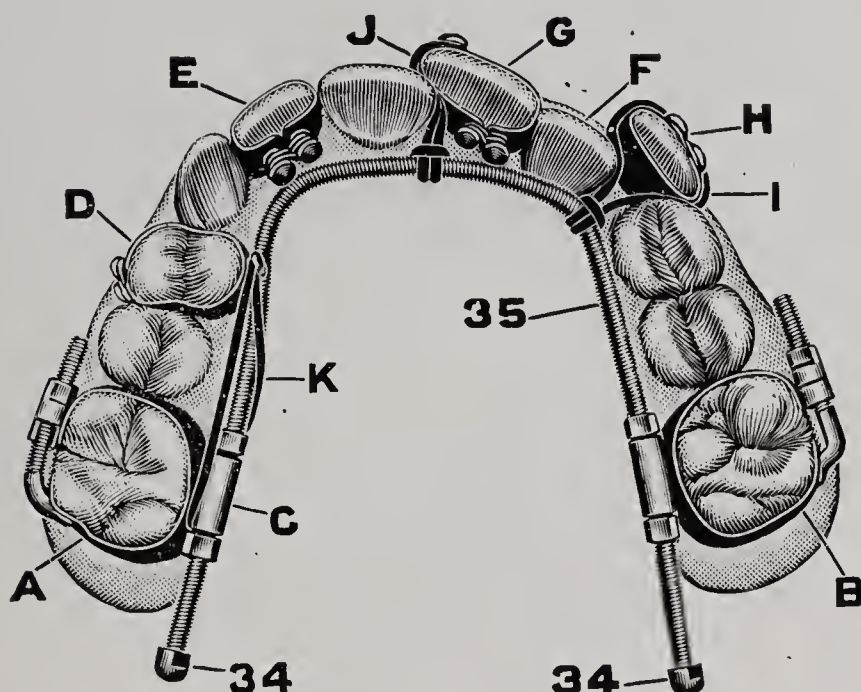
Fig. 21 shows some practical applications of the button bands and ligature bands when used in connection with an arch bar appliance. In this case the incisor teeth are to be moved forward so as to make room for the left cuspid which is then to be drawn into the arch. The left central and right first bicuspid are to be rotated.

The band E is cemented to the right lateral and the band G to the left central. These bands serve to hold the anterior portion of the arch bar No. 35 in position, as the arch bar passes between the buttons of the bands and the gum. The band E is a button band, the buttons serving to hold the arch bar in position. The band G is a ligature band, as it is necessary to have the extra button for the attachment of the rubber liga-

ture. The button band H is used on the cuspid as it is only necessary to prevent the rubber ligature from slipping off the tooth and the buttons serve this purpose. The bicuspid band D is also a ligature band, the central button affords attachment for a ligature to draw the lingual side of the tooth distally.

The bands A and B are double socket clutch tube bands No. 50. These serve to connect the arch bar to the molar teeth, the arch bar passes thru the clutch tubes of bands A and

Fig. 21.



B and then around the anterior portion of the arch between the buttons of the bands E and G and the gum. The arch bar is operated to move the incisors forward in the same manner as described under Fig. 20.

As the arch bar moves the incisors forward the rubber ligature which is looped over it and is connected to the cuspid, serves to draw the cuspid into line as fast as space is made for it.

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The rotation of the tooth G is accomplished by the rubber ligature J. This rubber is also looped over the arch bar and passes between the central incisor teeth. The action of the rubber passing as it does, will separate the incisors, at the same time it draws the mesial edge of the central lingually. The arch bar pressing against the disto-lingual angle of the central prevents this portion of the tooth from being moved, as the mesial portion is drawn lingually and rotation of the tooth is accomplished.

A rubber ligature, K, is passed over the distal end of the clutch tube, C, and then drawn forward and connected to the bottom of the band D. This rotates the bicuspid by drawing the lingual side of the tooth back while the buccal side will be held in position as it rests against the second bicuspid. It will be seen that almost an unlimited number of combinations may be made up by using the buttons and ligature bands in connection with an arch bar appliance.

Fig. 22 shows the simple arch bar appliance used to move the central incisor teeth forward. These teeth are banded with No. 5 studded bands, the bands having been cemented to the teeth and the cement allowed to harden before the arch bar is placed in position. No. 50 bands are clamped to the first molars. Two clutch nuts are used on each side to operate against the clutch tubes of the molar bands. In all cases where the arch bar is to move forward, the nuts at the distal ends of the clutch tubes of the molar bands are loosened and those at the anterior ends tightened. This moves the arch bar forward. It is absolutely necessary that these nuts be firmly locked in the clutch tubes to prevent their revolving, which would result in the loss of movement once gained. The two nuts are used on each side in order that this may be done. When, through

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carelessness, these nuts are not locked, the operator must not blame the patient or appliance for lack of success in the operation.

Fig. 22.

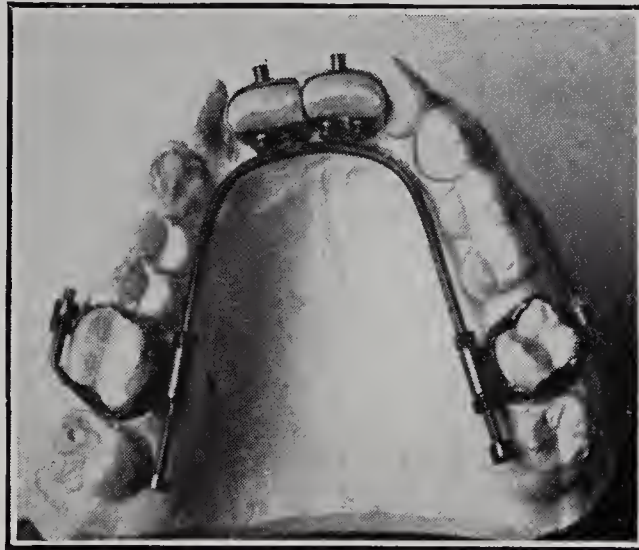


Fig. 23.

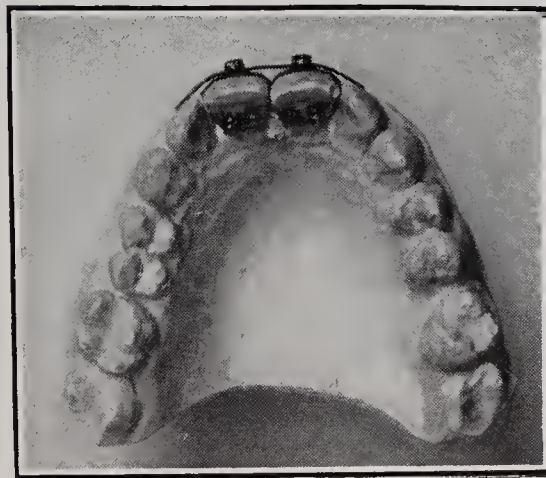
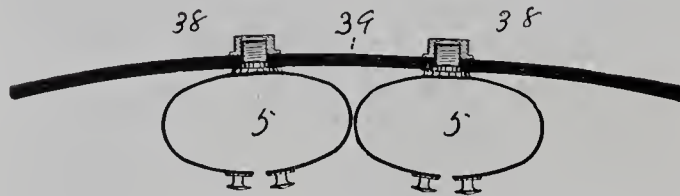


Fig. 23 shows the retaining appliance in position. This appliance is attached to the studs of the central bands by two retaining clamp nuts, No. 38. It will therefore be seen that by placing the studded bands on the centrals the retaining appliance can be placed in position without changing the bands,

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by simply attaching to the threaded studs. When the retainer is in position the arch bar and molar bands can, of course, be removed. A detail drawing of the retaining appliance and

Fig. 24.



bands is shown in Fig. 24. Fig. 25 shows positions of the teeth before the operation, and Fig. 26 shows their positions after the retainer has been removed.

Fig. 25.



Fig. 26.



Fig. 27 shows an arch bar appliance on the lingual side of a lower arch, the office of which is to move the lower incisor teeth forward into line. It will be found that in moving forward, the teeth will conform to the shape of the bar, so by simply bending the bar to the desired form of arch, the teeth will be in line when the operation is completed. The bands on

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the laterals are No. 2 studded bands, and their office is to prevent the arch bar slipping up on the teeth.

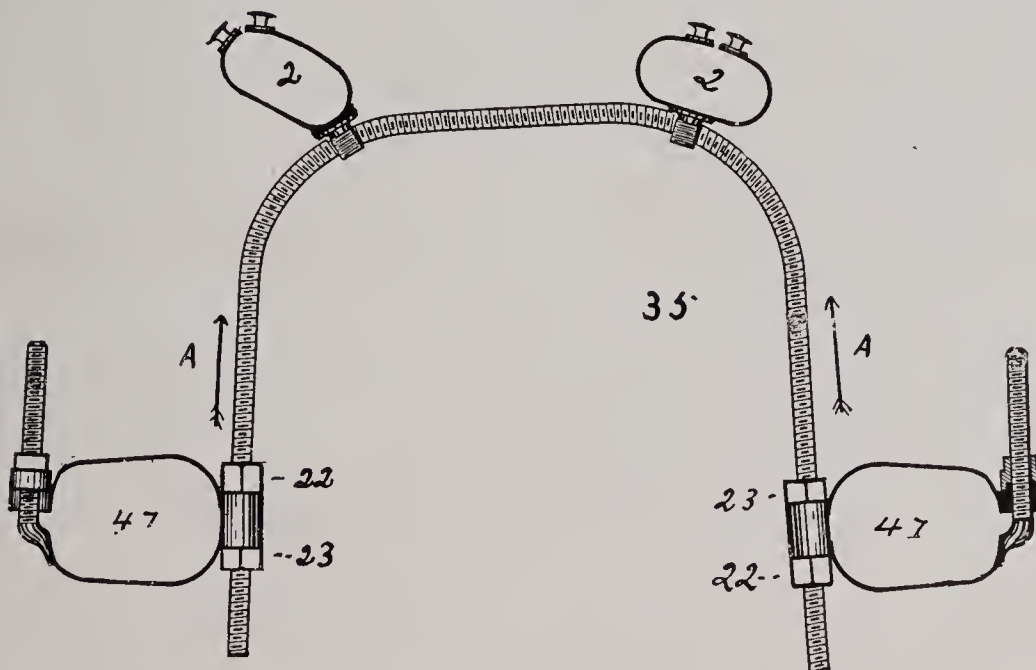
In this case the anchorage is gained from the second bicuspids. These teeth being banded with No. 47 single socket

Fig. 27.



screw bands. The detail of this appliance is shown in Fig. 28. The bands No. 47 are placed on the teeth with their clutch

Fig. 28.



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tubes on the lingual side of the arch. A lock nut, No. 23, and clutch nut, No. 22, are used on each side of the arch to engage the clutch tubes of each bicuspid band. The clutch nuts enter the recessed openings of the clutch tubes on the bicuspid bands and the lock nuts clamp the tubes firmly against the clutch nuts.

To operate the appliance the posterior nuts are loosened the proper amount and the anterior nuts tightened against the clutch tubes. This moves the appliance forward and locks it. The result is the same as that obtained by the appliance shown in Fig. 22, but this illustration serves to show how anchorage may be gained when the molars are not in condition to be used.

In cases where the arch bar is used on the lingual side of the lower arch it is advisable to anchor the second bicuspids whenever practical, for by so doing the arch bar does not extend as far back on each side of the mouth as when anchored to the molars and therefore offers less interference with the action of the tongue.

In Fig. 29 an arch bar is anchored to the first bicuspid on the right side and the first molar on the left. The object of this is to swing the left incisors forward. In the case illustrated the left lateral had been extracted, since it stood directly back of the cuspid and the arch was already of sufficient size to correspond with the upper. The left central was banded with a single socket button band, No. 11, and an arch bar bent and placed in position as shown. When the appliance is operated the bar will press first against the left central, then come in contact with the right central, and lastly with the lateral. Two clutch nuts, No. 22, are used to engage the clutch tube of the left molar band, and one No. 22 enters the anterior recessed opening of the single socket screw bands No. 47, which is on

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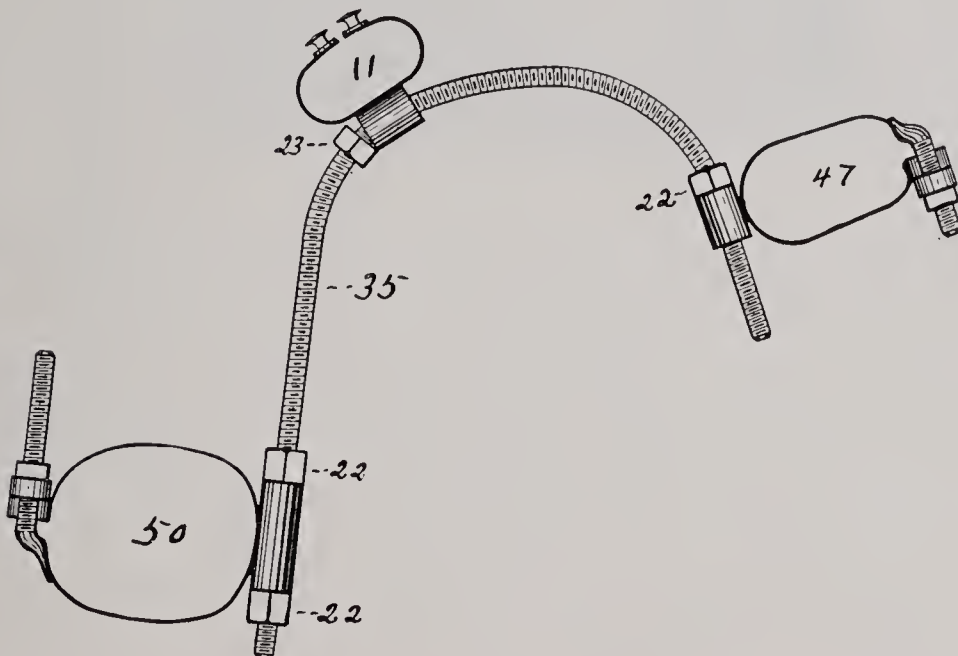
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the right first bicuspid. A lock nut is also placed on the arch bar to operate against the distal end of the clutch tube of the left central band to prevent the central slipping back on the bar, if such a tendency should be observed.

Fig. 29.



Fig. 30.



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Most of the movement is obtained by operating the clutch nuts which engage the clutch tube of the molar band, the clutch nut which engages the right first bicuspid band serving only to hold this end of the arch bar in position. It is not necessary to use a lock nut at the right first bicuspid band in this case, but the nuts at the clutch tube of the molar band should always be locked. If it be necessary to move the teeth to the right as well as forward, by operating the lock nut at the distal end of the clutch tube of the central band this result will be obtained. Fig. 30 gives the number and position of each part.

Fig. 31.



In the case shown in Fig. 31 the left central stands forward and is at least half the width of the tooth to the left of center line of the arch. It is therefore necessary to move it to the right and into the arch. An arch bar is employed to accomplish this. The first molars are banded, since they are sufficiently erupted. When bands can not easily be placed on the first molars, the temporary second molars are used, either the No. 49 double socket, or No. 48 single socket screw band

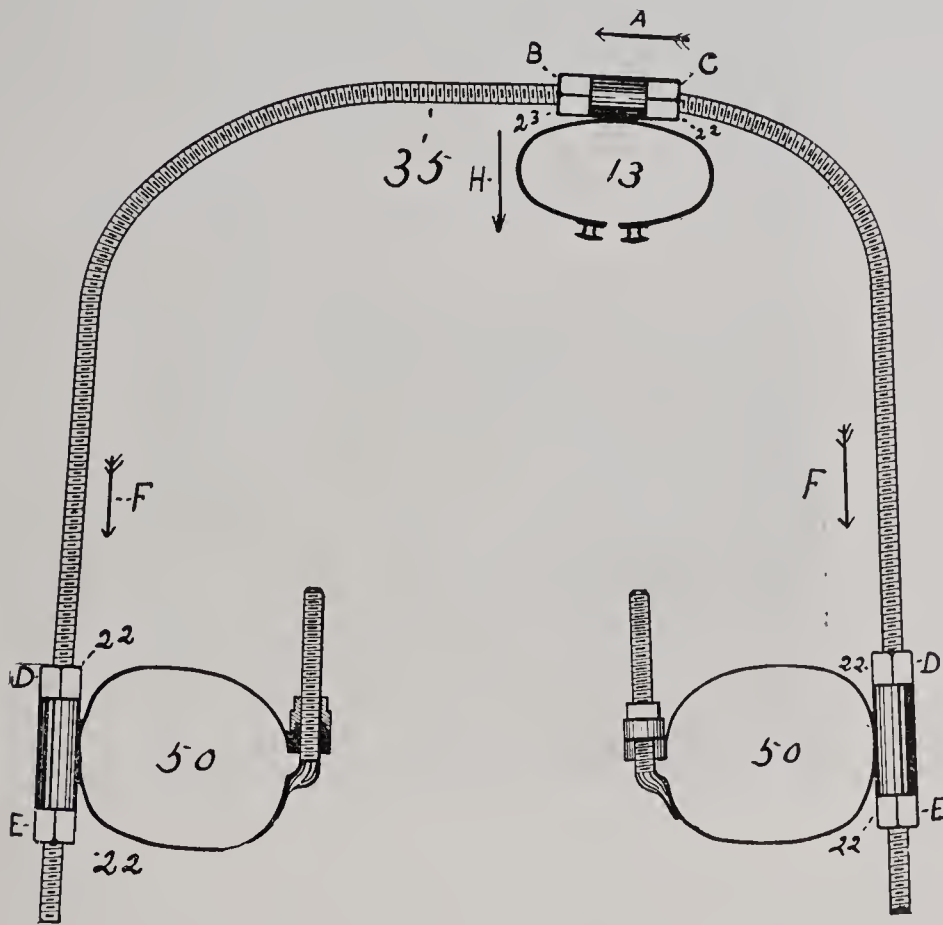
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may be used. Fig. 32 gives the detail of the appliance illustrated in Fig. 31.

A single socket button band, No. 12 or No. 13, according to size of central, is cemented to the left central and the cement allowed to harden. A clutch nut, No. 22, and a lock, No. 23, are employed on the arch bar to engage the clutch tube of this band. At the beginning of the operation the nuts engaging the

Fig. 32.



clutch tubes of the molar bands remain locked; the lock nut at the central band is loosened about three-fourths of a revolution permitting the central to be moved one one-hundred-and-fiftieth of an inch directly to the right when the nut No. 22 is tightened firmly against the clutch tube. This method of tightening is repeated every second day until the central is

**If your "Orthodontia" cases have not turned out successfully
See page 24.**

directly opposite the position it should take in the arch, when the nuts' engaging its clutch tube are permitted to remain locked and the nuts at the clutch tubes of the molar bands operated to draw the arch bar directly backward, thus placing the tooth in the arch. The tooth is thus moved first to the right and then posteriorly. The first movement frees it from the lateral which it overlaps. If the nuts at the clutch tube of the band on the central and those at the tubes of the bands on the molars are operated at the same time, the tooth will be moved obliquely to the right and distally. With this form of appliance any anterior tooth in the arch can be moved in practically any direction.

Fig. 33.

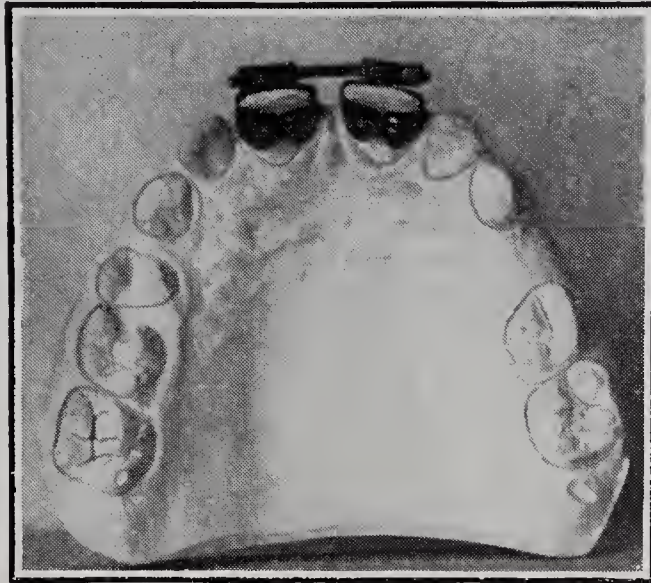


When the incisor teeth are separated, as shown in Fig. 33, they may be drawn together with the appliance illustrated in Figs. 34 and 35. This form of appliance will be found the best to use in all such cases.

Single socket bands are cemented to the central incisors with their clutch tubes on the labial surface of the teeth and the recessed openings of the clutch tubes projecting distally. When cementing the bands to the centrals, care should be ex-

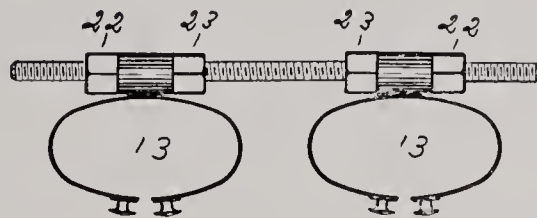
exercised to have the clutch tubes in perfect line, so that a piece of threaded arch bar No. 35 will pass through the openings of the clutch tubes without necessitating bending. Two lock nuts, No. 23, should be placed on this piece of threaded bar, which

Fig. 34.



should be of sufficient length to pass through the clutch tubes and project one-sixteenth of an inch at each end. A clutch nut, No. 22, should be placed on each end of the bar and the bar

Fig. 35.



then passed through the slotted sides of the clutch tubes. The rounded portion of the clutch nuts, No. 22, should be turned into the recessed openings of the tubes and the nuts, No. 23, then turned against the opposite ends.

To operate the appliance the nuts, No. 23, are loosened and the nuts, No. 22, tightened. This draws the teeth together.

Do you consider teeth regulation profitable? if not please read pages 24 and 26.

A PROPOSITION.

Dear Doctor :—

Numerous requests for me to fit appliances to casts so that operators might more quickly become familiar with my system of teeth-regulation, led me several years ago to make an offer to fit the appliances to casts and write personal letters of instruction regarding the operation of the appliances and treatment of the cases. This offer has been widely accepted and a great many operators are now doing successful regulating who had previously done none at all. The proposition has been renewed several times up to three years ago, but as it has not been renewed since then I am now receiving a great many letters from the profession inquiring whether I am still fitting appliances under the same conditions. Consequently I wish to again renew the offer as follows:

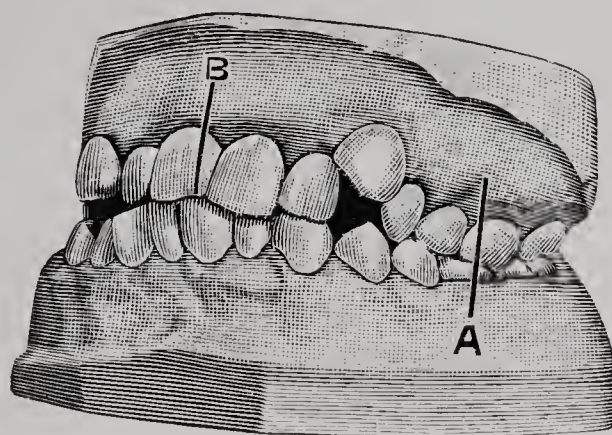
On receipt of casts, sent according to directions, and one dollar (\$1.00), which must always be sent with each cast to be fitted, I will fit to the cast the appliance which in my judgment is best for the case, and write a letter of instruction regarding the operation of the appliance, which teeth to extract, if any, and any other points regarding the treatment of the case that may be necessary.

The cast, with appliance fitted, will be sent, charges prepaid, by Express, C. O. D., for the catalog price of the parts used in making up the appliance. The dollar sent with the cast is extra for fitting.

No charge will be made for information regarding any case when the cast is not fitted with an appliance. If any person should not wish the appliance sent C. O. D., and will send cast and fill out blank, I will write him the price of the appliance necessary, and on receipt of the amount will send the appliance by Mail post paid.

Before sending casts please read instructions on the following page and be sure and send models according to directions. Be sure and write your name and address on the package. This is important, as I often receive five or six casts in one day with no mark whatever to tell whom they are from and this always causes much trouble and delay.

INSTRUCTIONS FOR SENDING CASTS.



From modeling compound impressions make plaster casts, articulate them as shown in the above cut and mark the occlusion on both sides, as at A. Carefully note the center-line of the FACE and mark it on the cast, as at B. The casts should be carefully packed so that the teeth will NOT BE IN CONTACT. (DO NOT SEND WAX BITES). Mark cast or package with NAME of shipper and send by mail.

Please do not varnish casts.

Please state by letter what you desire to do with the case and answer the following questions:

What is the age of patient? Is the upper lip of normal prominence?—too prominent?—deficient in prominence?—too short to cover the teeth properly? Is the lower lip of normal prominence?—too prominent?—receding? Is the chin and lower jaw lacking in development?—normally developed?—or too prominent? Does the center line of the Face coincide with the interdental space between the upper central incisors?—if not is it to the right?—or left?—(also mark center line on cast.) Do you desire to regulate both upper and lower arches?

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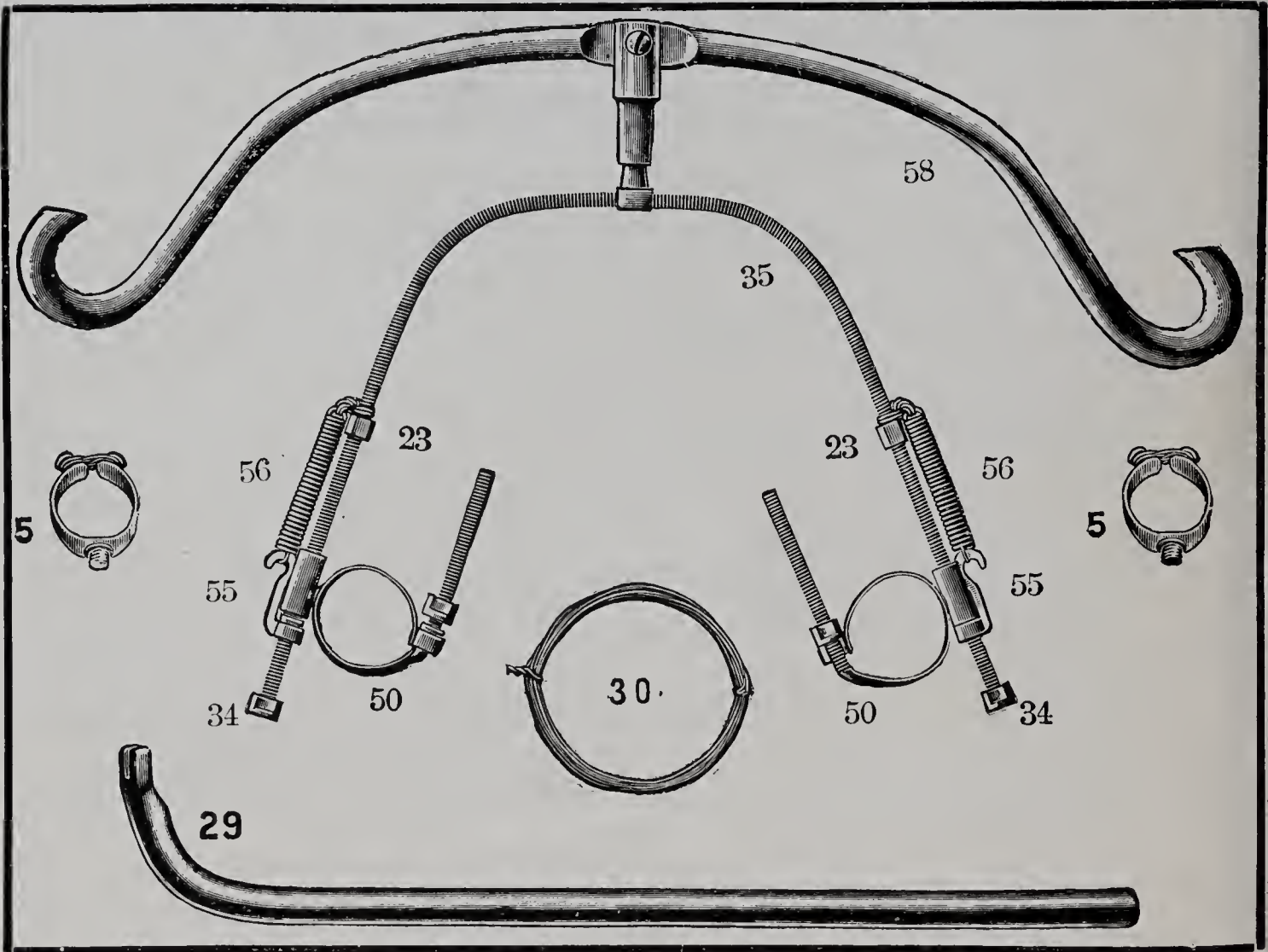
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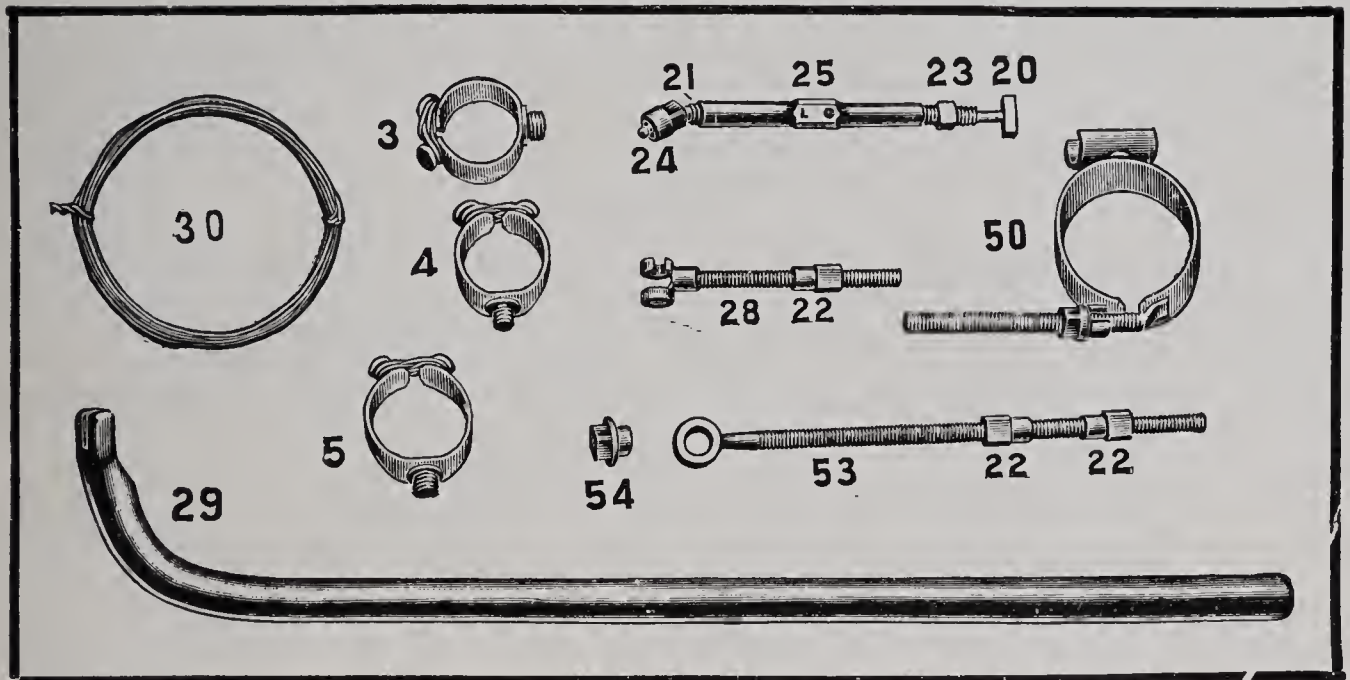
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